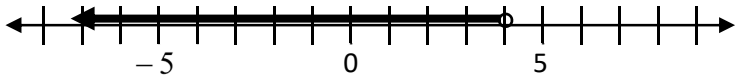
Chapter 7 Review #1 **Prob/Stats** **Name** _____

The statement represents a claim. Write its complement and state which is H_0 and which is H_a. Identify which one is the claim.

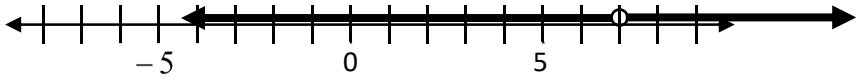
1. $p = 0.83$
2. $\mu \leq 123.5$
3. $\sigma < 2.8$

The alternative hypothesis is given with its graph. State the null hypothesis and sketch its graph.

4. $H_a : \mu < 4$



5. $H_a : \mu \neq 7$



Write the null and alternative hypotheses for each statement. Identify which one is the claim. State whether you do a left-tailed, right-tailed, or two-tailed test for the hypothesis test.

6. The mean age of bus drivers in Sacramento is 47.2 years.

7. The mean score for all MLB games during a particular season was less than 6 runs per game.

8. Using the statement in problem #6, identify, in context, the type I and type II errors for the hypothesis test of this claim.

9. The mean age of bus drivers in Sacramento is 47.2 years. If a hypothesis test is performed, how should you interpret a decision that rejects the null hypothesis?
   a) There is not sufficient evidence to reject the claim $\mu = 47.2$.
   b) There is sufficient evidence to reject the claim $\mu = 47.2$.
   c) There is sufficient evidence to support the claim $\mu = 47.2$.
   d) There is not sufficient evidence to support the claim $\mu = 47.2$.

10. Given $H_0 : \mu \geq 20.2$, for which confidence interval should you reject H_0?
    a) (18.5, 20.5)
    b) (17.6, 19.6)
    c) (19.8, 20.8)

11. The P-value for a hypothesis test is P = 0.045. Do you reject or fail to reject H_0 when the level of significance is $\alpha = 0.01$? What if the level of significance is $\alpha = 0.05$?

Find the P-value for the hypothesis test with the standardized test statistic z. Decide whether to reject H_0 for the level of significance α.

12. Right-tailed test, $z = 0.91, \alpha = 0.05$

13. Left-tailed test, $z = -1.75, \alpha = 0.05$

14. Two-tailed test, $z = 2.43, \alpha = 0.01$

Find the critical value(s) and rejection region(s) for the type of z-test with level of significance α.

15. Two-tailed test, $\alpha = 0.04$

16. Right-tailed test, $\alpha = 0.10$

17. A coffee shack claims that the mean waiting time in line is less than 2.9 minutes. A random sample of 60 customers has a mean of 2.8 minutes with a population standard deviation of 0.4 minute. If $\alpha = 0.05$, test the coffee shack's claim. Use a P-value.

18. A manufacturer claims that the mean lifetime of its fluorescent bulbs is 1000 hours. A homeowner selects 40 bulbs and finds the mean lifetime to be 990 hours with a population standard deviation of 80 hours. Test the manufacturer's claim. Use $\alpha = 0.05$ and rejection regions.